

AUTO BODY/FENDER REPAIR

INDUSTRY SECTOR: Transportation

CALPADS PATHWAY: Structural Repair and Refinishing (Pathway Code 220)

CALPADS COURSE TITLE: Advanced Structural Repair & Refinishing

CALPADS COURSE CODE: 8522

HOURS:	Total	Classroom	Laboratory/CC/CVE
	360	120	240

JOB TITLE	ONET CODES	JOB TITLE	ONET CODES
Auto Body & Related Repairers	49-3021.00	Welders, Cutters and Welder Fitters	51-4121.06
Painters, Transportation Equipment	51-9122.00		

ADVANCED STRUCTURAL REPAIR AND REFINISHING (CAPSTONE):

This capstone level course will provide students with the opportunity to function in a variety of roles within this pathway. Students will demonstrate competency in the skills and knowledge acquired in introductory and concentration level courses. Students will participate in work-based learning opportunities which can lead to internships. Students that successfully complete the course of study will qualify for industry-recognized certifications. Upon completion of this course, students will be prepared for an entry-level position at a vehicle collision and refinishing facility.

COURSE DESCRIPTION:

LEVEL: Introductory Concentrator Capstone

CERTIFICATION:

- Students who have completed two semesters of the program and successfully mastered the curriculum will receive a Certificate of Completion.
- Students who have completed less than the full year will receive a Certificate of Achievement.

PREREQUISITES:

1. Must be in Grades 11 or 12.
2. Must act as a responsible citizen in the workplace and the community.
3. Displays an interest in the auto body and fender repair industry.

METHOD OF STUDENT EVALUATION:

- ✓ Pre and Post test
- ✓ Student Projects
- ✓ Written work
- ✓ Observation record of student performance
- ✓ Completion of assignments and worksheets

METHOD OF INSTRUCTION:

- ✓ Lecture
- ✓ Group and individual applied projects
- ✓ Demonstration
- ✓ Field Trips
- ✓ Guest Speaker

RECOMMENDED TEXT(S):

Duffy, James E., *Auto Body Repair Technology*. Capital Region Albany, New York: Delmar Cengage Learning, 2009. Print.

Hanson, Steve, *Mitchell Estimating Guide*. San Diego, California: Mitchell International.

MODEL CTE PATHWAY: The Structural Repair and Refinishing pathway prepares students for postsecondary education and employment in the transportation industry, including but not limited to body and frame straightening, estimating, painting, and refinishing (included but not limited to airplanes, trains, vehicles, and equipment).

I.	BASIC SHOP AND SAFETY PROCEDURES	CR	LAB/ CC	STANDARDS
	A. Proper eye, lung and hand protection B. Care in the use of hydraulic jacks, safety stands and power tools including electrical and pneumatic. C. Care in the use of flammable liquids including acetone, primers, basecoats, and urethane clear coats. D. Proper disposal of hazardous material	30 HRS	0 HRS	CTE Anchor: A3.2; A6.1, A6.2, A6.3, A6.4, A6.5, A6.6, A6.7; A7.3, A7.8 CTE Pathway: B1.0, B1.1, B1.2, B1.6; B2.0; B4.4; B9.1, B9.3
II.	USE OF BASIC POWER TOOLS AND FASTENERS	CR	LAB/ CC	STANDARDS
	A. Types of tools used in auto body shops <ol style="list-style-type: none"> 1. Assorted pneumatic grinders, cutters, impact wrenches, drills, dual action sanders and disc sanders 2. Assorted metal shaping hammers, handheld metal blocks (Dollys) 3. Standard and metric-sized wrenches, sockets, ratchets, nuts and bolts B. Types of fasteners used in auto body shops <ol style="list-style-type: none"> 1. Selection of correct bolts and thread size, molding fasteners, trim adhesives, and rivets (plastic or metal) 	30 HRS	0 HRS	CTE Anchor: A1.0; A4.0, A4.1, A4.2, A4.3, A4.4, A4.5, A4.6; A7.3 CTE Pathway: B2.0, B2.1, B2.2; B4.1; B9.1, B9.2
III.	AUTOMOTIVE BODY CONSTRUCTION	CR	LAB/ CC	STANDARDS
	A. Theory of frame and chassis construction <ol style="list-style-type: none"> 1. Alignment of frame structures 2. Types of frames, including unitized and channeled steel 3. Correction of misalignment 	30 HRS	0 HRS	CTE Anchor: A4.0; A10.0, A10.1, A10.2, A10.3, A10.4 CTE Pathway: B3.0, B3.1; B4.1, B4.3, B4.5, B4.6; B7.0, B7.1, B7.2, B7.4, B7.5
IV.	VEHICLE BODY DAMAGE PROCEDURES	CR	LAB/ CC	STANDARDS
	A. Techniques used in straightening metal and metal finishing damaged areas <ol style="list-style-type: none"> 1. Hammer and Dolly techniques 2. Types of hammers used 3. Use of stud welders and pullers 4. Alignment of body panels 	0 HRS	30 HRS	CTE Anchor: A3.5; A4.0; A6.4; A7.8; A11.0, A11.1 CTE Pathway: B4.3, B4.6; B7.0, B7.4, B7.5, B7.6; B8.0; B9.1
V.	USE OF FILLERS FOR DAMAGED AREAS	CR	LAB/ CC	STANDARDS
	A. Polyester filler techniques <ol style="list-style-type: none"> 1. Metal preparation 2. Mixing poly filler in accordance with instructions 3. Correct application of filler 4. Shaping of poly filler 5. Preparation of damaged area prior to primer surfacing 	0 HRS	30 HRS	CTE Anchor: A11.1, A11.2, A11.3, A11.4, A11.5 CTE Pathway: B1.4; B4.0, B4.2; B7.4, B7.6; B9.1

VI.	POLYESTER PRIMER SURFACING TECHNIQUES	CR	LAB/ CC	STANDARDS
	<ul style="list-style-type: none"> A. Paper masking prior polyester primer surface B. Correct mixing of poly prime C. Correct primer spraying techniques 	0 HRS	30 HRS	<p>CTE Anchor: A1.0; A4.0; A6.0, A6.1, A6.2, A6.3; A7.8</p> <p>CTE Pathway: B1.4; B4.0, B4.2; B7.4; B9.0, B9.1, B9.2, B9.3</p>
VII.	AUTOMOTIVE DAMAGE ESTIMATION	CR	LAB/ CC	STANDARDS
	<ul style="list-style-type: none"> A. Customer relations B. Mitchell Manual C. Writing estimates D. Estimating cost, time and materials 	0 HRS	30 HRS	<p>CTE Anchor: A1.0; A2.0, A2.1, A2.2, A2.3, A2.4, A2.5, A2.6; A3.1, A3.4, A3.5; A4.0; A7.3, A7.4, A7.5, A7.6, A7.7, A7.8</p> <p>CTE Pathway: B2.1; B3.0, B3.1, B3.2, B3.4; B5.0, B5.1, B5.2, B5.3; B6.0; B7.0, B7.4; B8.0, B8.1, B8.2; B9.1</p>
VIII.	AUTOMOTIVE REFINISHING PROCEDURES	CR	LAB/ CC	STANDARDS
	<ul style="list-style-type: none"> A. Preparation <ul style="list-style-type: none"> 1. Sanding 2. Masking B. Understanding single stage, base coat and clear coat refinishing C. Correct spray room procedures D. Updating year to year changes of products <ul style="list-style-type: none"> 1. Correct disposal of liquids 2. State laws concerning legalities 3. Safe spraying procedures 	0 HRS	30 HRS	<p>CTE Anchor: A3.5; A4.0; A5.0, A5.1, A5.2, A5.3, A5.4; A6.0, A6.1, A6.2, A6.3; A7.5, A7.8</p> <p>CTE Pathway: B1.0, B1.3, B1.5; B3.4; B4.0, B4.2; B6.1, B6.2, B6.3, B6.4; B7.4; B9.0, B9.3, B9.4, B9.6</p>
IX.	POLISHING AND DETAIL	CR	LAB/ CC	STANDARDS
	<ul style="list-style-type: none"> A. Polishing and buffing prior to vehicle delivery B. Use of different pads and liquid polishes and rubbing compounds 	0 HRS	30 HRS	<p>CTE Anchor: A5.1, A5.2, A5.3, A5.4; A7.5</p> <p>CTE Pathway: B9.0, B9.5, B9.6</p>
X.	AUTOMOTIVE BODY AND FRAME WELDING	CR	LAB/ CC	STANDARDS
	<ul style="list-style-type: none"> A. Proper use of MIG welders B. Usage of DCASMA cutters C. Usage of Oxy/Acetylene torches 	0 HRS	30 HRS	<p>CTE Anchor: A6.0, A6.1, A6.2, A6.3, A6.4, A6.5, A6.6, A6.7; A11.1</p> <p>CTE Pathway: B2.0; B3.3; B4.4; B7.0, B7.3; B8.0</p>

XI.	EMPLOYMENT PREPARATION	CR	LAB/ CC	STANDARDS
	<ul style="list-style-type: none"> A. Completing a job application B. Job resume preparation C. Interviewing techniques D. Follow-up calls E. Explain ethics and legal responsibilities 	30 HRS	0 HRS	<p>CTE Anchor: A1.0; A3.0, A3.1, 3.2, A3.3, A3.6, A3.8, A3.9; A7.1, A7.2, A7.6, A7.7; A8.0, A8.1, A8.2, A8.3, A8.4, A8.5, A8.6, A8.7; A9.0, A9.1, A9.2, A9.3, A9.4, A9.5, A9.6, A9.7</p> <p>CTE Pathway: B6.0, B6.2, B6.3, B6.4, B6.5; B7.0</p>
XIII. STANDARDS FOR CAREER READY PRACTICE				
	<ol style="list-style-type: none"> 1. Apply appropriate technical skills and academic knowledge. 2. Communicate clearly, effectively, and with reason. 3. Develop an education and career plan aligned with personal goals. 4. Apply technology to enhance productivity. 5. Utilize critical thinking to make sense of problems and persevere in solving them. 6. Practice personal health and understand financial literacy. 7. Act as a responsible citizen in the workplace and the community. 8. Model integrity, ethical leadership and effective management. 9. Work productively in teams while integrating cultural and global competence. 10. Demonstrate creativity and innovation. 11. Employ valid and reliable research strategies. 12. Understand the environment, social and economic impacts of decisions. 			

TRANSPORTATION KNOWLEDGE AND PERFORMANCE ANCHOR STANDARDS

1.0 Academics

Analyze and apply appropriate academic standards required for successful industry sector pathway completion leading to postsecondary education and employment. Refer to the Transportation academic alignment matrix for identification of standards.

2.0 Communications

Acquire and accurately use Transportation sector terminology and protocols at the career and college readiness level for communicating effectively in oral, written, and multimedia formats. (Direct alignment with LS 9-10, 11-12.6)

- 2.1 Recognize the elements of communication using a sender–receiver model.
- 2.2 Identify barriers to accurate and appropriate communication.
- 2.3 Interpret verbal and nonverbal communications and respond appropriately.
- 2.4 Demonstrate elements of written and electronic communication such as accurate spelling, grammar, and format.
- 2.5 Communicate information and ideas effectively to multiple audiences using a variety of media and formats.
- 2.6 Advocate and practice safe, legal, and responsible use of digital media information and communications technologies.

3.0 Career Planning and Management

Integrate multiple sources of career information from diverse formats to make informed career decisions, solve problems, and manage personal career plans. (Direct alignment with SLS 11-12.2)

- 3.1 Identify personal interests, aptitudes, information, and skills necessary for informed career decision making.
- 3.2 Evaluate personal character traits such as trust, respect, and responsibility and understand the impact they can have on career success.
- 3.3 Explore how information and communication technologies are used in career planning and decision-making.
- 3.4 Research the scope of career opportunities available and the requirements for education, training, certification, and licensure.
- 3.5 Integrate changing employment trends, societal needs, and economic conditions into career planning.
- 3.6 Recognize the role and function of professional organizations, industry associations, and organized labor in a productive society.
- 3.7 Recognize the importance of small business in the California and global economies.
- 3.8 Understand how digital media are used by potential employers and postsecondary agencies to evaluate candidates.
- 3.9 Develop a career plan that reflects career interests, pathways, and postsecondary options.

4.0 Technology

Use existing and emerging technology to investigate, research, and produce products and services, including new information, as required in the Transportation sector workplace environment. (Direct alignment with WS 11-12.6)

- 4.1 Use electronic reference materials to gather information and produce products and services.
- 4.2 Employ Web-based communications responsibly and effectively to explore complex systems and issues.
- 4.3 Use information and communication technologies to synthesize, summarize, compare, and contrast information from multiple sources.
- 4.4 Discern the quality and value of information collected using digital technologies, and recognize bias and intent of the associated sources.
- 4.5 Research past, present, and projected technological advances as they impact a particular pathway.
- 4.6 Assess the value of various information and communication technologies to interact with constituent populations as part of a search of the current literature or in relation to the information task.

5.0 Problem Solving and Critical Thinking

Conduct short, as well as more sustained, research to create alternative solutions to answer a question or solve a problem unique to the Transportation sector using critical and creative thinking, logical reasoning, analysis, inquiry, and problem-solving techniques. (Direct alignment with WS 11-12.7)

- 5.1 Identify and ask significant questions that clarify various points of view to solve problems.

- 5.2 Solve predictable and unpredictable work-related problems using various types of reasoning (inductive, deductive) as appropriate.
- 5.3 Use systems thinking to analyze how various components interact with each other to produce outcomes in a complex work environment.
- 5.4 Interpret information and draw conclusions, based on the best analysis, to make informed decisions.

6.0 Health and Safety

Demonstrate health and safety procedures, regulations, and personal health practices and determine the meaning of symbols, key terms, and domain-specific words and phrases as related to the Transportation sector workplace environment. (Direct alignment with RSTS 9-10, 11-12.4)

- 6.1 Locate, and adhere to, Material Safety Data Sheet (MSDS) instructions.
- 6.2 Interpret policies, procedures, and regulations for the workplace environment, including employer and employee responsibilities.
- 6.3 Use health and safety practices for storing, cleaning, and maintaining tools, equipment, and supplies.
- 6.4 Practice personal safety when lifting, bending, or moving equipment and supplies.
- 6.5 Demonstrate how to prevent and respond to work-related accidents or injuries; this includes demonstrating an understanding of ergonomics.
- 6.6 Maintain a safe and healthful working environment.
- 6.7 Be informed of laws/acts pertaining to the Occupational Safety and Health Administration (OSHA).

7.0 Responsibility and Flexibility

Initiate, and participate in, a range of collaborations demonstrating behaviors that reflect personal and professional responsibility, flexibility, and respect in the Transportation sector workplace environment and community settings. (Direct alignment with SLS 9-10, 11-12.1)

- 7.1 Recognize how financial management impacts the economy, workforce, and community.
- 7.2 Explain the importance of accountability and responsibility in fulfilling personal, community, and workplace roles.
- 7.3 Understand the need to adapt to changing and varied roles and responsibilities.
- 7.4 Practice time management and efficiency to fulfill responsibilities.
- 7.5 Apply high-quality techniques to product or presentation design and development.
- 7.6 Demonstrate knowledge and practice of responsible financial management.
- 7.7 Demonstrate the qualities and behaviors that constitute a positive and professional work demeanor, including appropriate attire for the profession.
- 7.8 Explore issues of global significance and document the impact on the Transportation sector.

8.0 Ethics and Legal Responsibilities

Practice professional, ethical, and legal behavior, responding thoughtfully to diverse perspectives and resolving contradictions when possible, consistent with applicable laws, regulations, and organizational norms. (Direct alignment with SLS 11-12.1d)

- 8.1 Access, analyze, and implement quality assurance standards of practice.
- 8.2 Identify local, district, state, and federal regulatory agencies, entities, laws, and regulations related to the Transportation industry sector.
- 8.3 Demonstrate ethical and legal practices consistent with Transportation sector workplace standards.
- 8.4 Explain the importance of personal integrity, confidentiality, and ethical behavior in the workplace.
- 8.5 Analyze organizational culture and practices within the workplace environment.
- 8.6 Adhere to copyright and intellectual property laws and regulations, and use and appropriately cite proprietary information.
- 8.7 Conform to rules and regulations regarding sharing of confidential information, as determined by Transportation sector laws and practices.

9.0 Leadership and Teamwork

Work with peers to promote divergent and creative perspectives, effective leadership, group dynamics, team and individual decision making, benefits of workforce diversity, and conflict resolution as practiced in the Skills USA career technical student organization (Direct alignment with SLS 11-12.1b)

- 9.1 Define leadership and identify the responsibilities, competencies, and behaviors of successful leaders.

- 9.2 Identify the characteristics of successful teams, including leadership, cooperation, collaboration, and effective decision-making skills as applied in groups, teams, and career technical student organization activities.
- 9.3 Understand the characteristics and benefits of teamwork, leadership, and citizenship in the school, community, and workplace setting.
- 9.4 Explain how professional associations and organizations and associated leadership development and competitive career development activities enhance academic preparation, promote career choices, and contribute to employment opportunities.
- 9.5 Understand that the modern world is an international community and requires an expanded global view.
- 9.6 Respect individual and cultural differences and recognize the importance of diversity in the workplace.
- 9.7 Participate in interactive teamwork to solve real Transportation sector issues and problems.

10.0 Technical Knowledge and Skills

Apply essential technical knowledge and skills common to all pathways in the Transportation sector, following procedures when carrying out experiments or performing technical tasks. (Direct alignment with WS 11-12.6)

- 10.1 Interpret and explain terminology and practices specific to the Transportation sector.
- 10.2 Comply with the rules, regulations, and expectations of all aspects of the Transportation sector.
- 10.3 Construct projects and products specific to the Transportation sector requirements and expectations.
- 10.4 Collaborate with industry experts for specific technical knowledge and skills.

11.0 Demonstration and Application

Demonstrate and apply the knowledge and skills contained in the Transportation anchor standards, pathway standards, and performance indicators in classroom, laboratory, and workplace settings, and through the SkillsUSA career technical student organization.

- 11.1 Utilize work-based/workplace learning experiences to demonstrate and expand upon knowledge and skills gained during classroom instruction and laboratory practices specific to the Transportation sector program of study.
- 11.2 Demonstrate proficiency in a career technical pathway that leads to certification, licensure, and/or continued learning at the postsecondary level.
- 11.3 Demonstrate entrepreneurship skills and knowledge of self-employment options and innovative ventures.
- 11.4 Employ entrepreneurial practices and behaviors as appropriate to the Transportation sector opportunities.
- 11.5 Create a portfolio, or similar collection of work, that offers evidence through assessment and evaluation of skills and knowledge competency as contained in the anchor standards, pathway standards, and performance indicators.

TRANSPORTATION STRUCTURAL REPAIR AND REFINISHING PATHWAY STANDARDS

Structural Repair and Refinishing Pathway

The Structural Repair and Refinishing pathway prepares students for postsecondary education and employment in the transportation industry, including but not limited to body and frame straightening, estimating, painting, and refinishing (included but not limited to airplanes, trains, vehicles, and equipment).

Sample occupations associated with this pathway:

- Estimator
- Claims Adjuster
- Technician
- Insurance Company/Manufacturer's Representative
- Investigator/Inspector

B1.0 Students practice personal and occupational safety and understand the environmental effects of collision repair and refinishing practices.

B1.1 Describe industry environmental conservation practices and their applications.

B1.2 Practice the safe handling and storage of chemicals and hazardous wastes as required by the Occupational Safety and Health Administration (OSHA), Air Resources Board (ARB), Air Quality Management Districts (AQMDs), and other regulatory agencies.

B1.3 Understand the generation of waste products and other environmentally destructive substances.

B1.4 Use appropriate materials and repair technologies.

B1.5 Understand the environmental implications of using new and emerging materials, resources, and technologies.

B1.6 Demonstrate the safety practices applied when servicing vehicle-body electronics and other vehicle systems.

B2.0 Practice the safe and appropriate use of tools, equipment, and work processes.

B2.1 Understand how certain tools and equipment are used to perform maintenance and repair operations.

B2.2 Use tools, equipment, and machines to safely measure, test, diagnose, and analyze components and systems (e.g., electrical and electronic circuits, alternating and direct current applications, fluid/hydraulic and air/pneumatic systems).

B3.0 Apply measurement systems and the mathematical functions necessary to perform required fabrication, maintenance, and operation procedures.

B3.1 Use industry-standard measurement scales, devices, and systems to perform design, fabrication, diagnostic, maintenance, and repair procedures.

B3.2 Use technical vocabulary, technical reports and manuals, electronic systems, and related technical data resources, as appropriate, to determine repairs and estimates.

B3.3 Demonstrate the different types of welding and heat processes used in repair processes and procedures.

B3.4 Understand the mathematical functions associated with collision repair and refinishing.

B4.0 Apply scientific principles in relation to chemical, mechanical, and physical functions and in relation to industry and manufacturer standards.

B4.1 Identify and understand the physical and chemical characteristics of metals, plastics, and other materials.

B4.2 Describe the basic terms, characteristics, and concepts of physical and chemical processes.

B4.3 Apply the principles of mechanical, electrical, hydraulic, and pneumatic power in relation to collision repair and refinishing.

B4.4 Practice the principles of electricity and electronics.

B4.5 Understand body and frame construction.

B4.6 Know the importance of calibration processes, systems, and techniques in using various measurement and testing devices.

B5.0 Perform and document repair procedures in accordance with manufacturer recommendations and industry standards.

B5.1 Explain and practice the recommended procedures and practices of various manufacturers.

B5.2 Use reference books and materials, technical service bulletins, and other related documents to determine repairs and rate of pay.

B5.3 Document repair procedures accurately as required by the Bureau of Automotive Repair and other regulatory agencies.

B6.0 Demonstrate basic business practices.

B6.1 Know the laws and regulations applicable to the recordkeeping and handling of hazardous materials.

B6.2 Use and understand work-related systems.

B6.3 Practice and understand the importance of, and procedures for, maintaining accurate records.

B6.4 Discuss and apply the concept and application of accepted ethical business practices.

B6.5 Use and understand the concept and application of acceptable customer relations services.

B7.0 Understand structural and nonstructural analysis and damage repair.

B7.1 Perform frame inspection and repair.

B7.2 Demonstrate applications, installations, and removal of fixed and moveable glass and hardware.

B7.3 Demonstrate the principles of metal welding and cutting.

B7.4 Prepare and analyze vehicles for repair.

B7.5 Perform outer body panel repairs, replacements, and adjustments.

B7.6 Prepare vehicles for metal finishing and body filling.

B8.0 Demonstrate an understanding of mechanical and electrical components in relation to industry and manufacturer standards.

B8.1 Identify and communicate the operation of drivetrain, fuel, intake, and exhaust systems.

B8.2 Perform steering and suspension analysis and repairs.

B8.3 Perform electrical repairs.

B8.4 Perform brake analysis and repairs.

B8.5 Perform heating, air-conditioning, and cooling system repairs.

B8.6 Explain and demonstrate the operation of restraint systems.

B9.0 Demonstrate the concepts, principles, and practices of painting and refinishing.

B9.1 Identify, use, and repair plastics and adhesives.

B9.2 Prepare surfaces for painting and finishing.

B9.3 Practice operation of spray guns and related equipment.

B9.4 Practice mixing, matching, and applying paint.

B9.5 Prepare vehicles for final detail.

B9.6 Analyze the causes and cures of paint defects.

**North Kern Vocational Training Center
AUTO BODY/FENDER REPAIR PROFICIENCIES**

1. Upon completion of the course students will be able to follow industry safety standards in a shop environment.
2. Upon completion of the course students will be able to identify and demonstrate to the instructor the proper use of each tool.
3. Upon completion of course students will be able to mix and apply body filler and polyester glaze putty in accordance with labeled instructions.
4. Upon completion of the course students will be able to operate an air sander in a professional and safe manner.
5. Upon completion of the course students will be able to operate an electric grinder and drill in a professional and safe manner.
6. Upon completion of the course students will be able to shrink a panel, according to industry standards, in order to recreate proper body contour.
7. Upon completion of the course students will be able to align doors to manufacture specifications.
8. Upon completion of the course students will be able to align panels to manufacture specifications.
9. Upon completion of the course students will be able to mask a vehicle properly within time constraints.
10. Upon completion of the course students will be able to prepare a vehicle for painting in accordance with industry standards.
11. Upon completion of the course students will be able to properly use a port-a-power on a vehicle.
12. Upon completion of the course students will be able to set-up Oxy-Acetylene equipment demonstrating proper safety procedures.
13. Upon completion of the course students will be able to weld a butt joint and tee joint in flat and vertical up position using Oxy-Acetylene equipment and procedures.
14. Upon completion of the course students will be able to weld a continuous bead on a piece of metal and spot-weld on metal.
15. Upon completion of the course students will be able to cut metal with the plasma cutter equipment.
16. Upon completion of the course students will be able to demonstrate a basic understanding of ethical and legal business practices including estimating, customer service, and record keeping.